

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

## REVISED VERSION

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
8 April 2004 (08.04.2004)

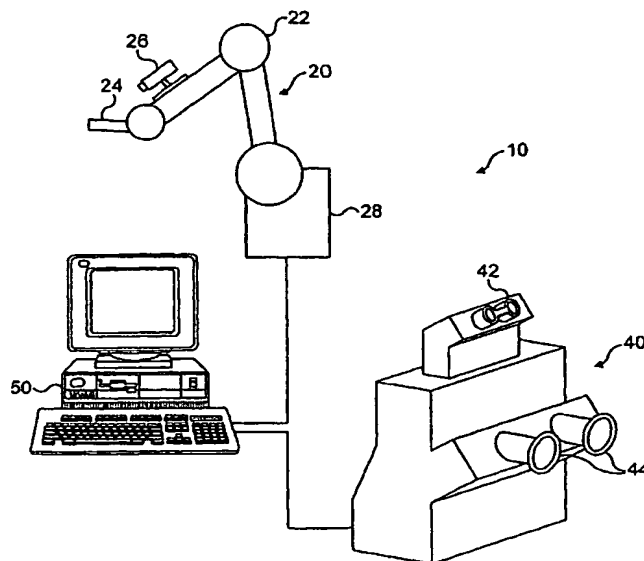
PCT

(10) International Publication Number  
WO 2004/029786 A1

- (51) International Patent Classification<sup>7</sup>: G06F 3/00, H04N 13/00, B25J 13/08, A61B 19/00
- (21) International Application Number: PCT/GB2003/004077
- (22) International Filing Date: 25 September 2003 (25.09.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data: 0222265.1 25 September 2002 (25.09.2002) GB
- (71) Applicant (for all designated States except US): IMPERIAL COLLEGE INNOVATIONS LIMITED [GB/GB]; Electrical and Electronic Engineering Building, Level 12, Imperial College, Exhibition Road, London SW7 2AZ (GB).
- (72) Inventors; and  
(75) Inventors/Applicants (for US only): YANG, Guang, Zhong [GB/GB]; 4 McKenzie Way, Epsom, Surrey, KT19 7ND (GB). DARZI, Ara [GB/GB]; 93 Windsor Road, Gerrards Cross, Buckinghamshire, SL9 7NW (GB).
- (74) Agents: ROBERTS, Gwilym, Vaughan et al.; Kilburn & Strode, 20 Red Lion Street, London WC1R 4PJ (GB).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,

[Continued on next page]

(54) Title: CONTROL OF ROBOTIC MANIPULATION



(57) Abstract: In a remote controlled robotic manipulator (20) a motion sensor (26) senses motion of a region of an object to be manipulated. A controller (50) locks motion of the robotic manipulator (26) relative to the region of the object and also selects the region of the object to be sensed. As a result the frame of reference of the manipulator is locked to the relevant region of the object to be manipulated improving ease of control and manipulation.